

SEQUENCE LISTING

<110> Fedida, David
Steele, David

<120> MUTATIONS OF VOLTAGE-GATED ION CHANNELS
THAT ALLOW THEM TO EXPRESS A VOLTAGE-INDEPENDENT PHENOTYPE
AND AN IMPROVED METHOD TO USE THE SAME

<130> 480102.425USPC

<140> US

<141> 2003-07-14

<150> US 60/395,272

<151> 2002-07-12

<160> 13

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 45

<212> DNA

<213> Homo sapiens

<400> 1
atcctccaag tcatccaact ggtccgggtg ttccaaatct tcaag 45

<210> 2

<211> 44

<212> DNA

<213> Homo sapiens

<400> 2
ttgaagattg gaacacccgg accagttgga tgacttggag gatg 44

<210> 3

<211> 33

<212> DNA

<213> Homo sapiens

<400> 3
attgccctgc ctgtggacgt catcgtctcc aac 33

<210> 4

<211> 33

<212> DNA

<213> Homo sapiens

<400> 4
ttggagacga tgacgtccac aggcagggca atg 33

<210> 5
 <211> 159
 <212> PRT
 <213> Homo sapiens

<400> 5
 Pro Tyr Phe Ile Thr Leu Gly Thr Glu Ile Ala Glu Gln Glu Gly Asn
 1 5 10 15
 Gln Lys Gly Glu Gln Ala Thr Ser Leu Ala Ile Leu Arg Val Ile Arg
 20 25 30
 Leu Val Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly
 35 40 45
 Leu Gln Ile Leu Gly Gln Thr Leu Lys Ala Ser Met Arg Glu Leu Gly
 50 55 60
 Leu Leu Ile Phe Phe Leu Phe Ile Gly Val Ile Leu Phe Ser Ser Ala
 65 70 75 80
 Val Tyr Phe Ala Glu Ala Glu Glu Ala Glu Ser His Phe Ser Ser Ile
 85 90 95
 Pro Asp Ala Phe Trp Trp Ala Val Val Ser Met Thr Thr Val Gly Tyr
 100 105 110
 Gly Asp Met Tyr Pro Val Thr Ile Gly Gly Lys Ile Val Gly Ser Leu
 115 120 125
 Cys Ala Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro Val Ile
 130 135 140
 Val Ser Asn Phe Asn Tyr Phe Tyr His Arg Glu Thr Glu Gly Glu
 145 150 155

<210> 6
 <211> 160
 <212> PRT
 <213> Mus Musculus

<400> 6
 Pro Tyr Phe Ile Thr Leu Gly Thr Glu Leu Ala Glu Lys Pro Glu Asp
 1 5 10 15
 Ala Gln Gln Gly Gln Gln Ala Met Ser Leu Ala Ile Leu Arg Val Ile
 20 25 30
 Arg Leu Val Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys
 35 40 45
 Gly Leu Gln Ile Leu Gly Gln Thr Leu Lys Ala Ser Met Arg Glu Leu
 50 55 60
 Gly Leu Leu Ile Phe Phe Leu Phe Ile Gly Val Ile Leu Phe Ser Ser
 65 70 75 80
 Ala Val Tyr Phe Ala Glu Ala Asp Glu Arg Asp Ser Gln Phe Pro Ser
 85 90 95
 Ile Pro Asp Ala Phe Trp Trp Ala Val Val Ser Met Thr Thr Val Gly
 100 105 110
 Tyr Gly Asp Met Val Pro Thr Thr Ile Gly Gly Lys Ile Val Gly Ser
 115 120 125
 Leu Cys Ala Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro Val
 130 135 140
 Ile Val Ser Asn Phe Asn Tyr Phe Tyr His Arg Glu Thr Glu Gly Glu
 145 150 155 160

<210> 7
 <211> 161
 <212> PRT
 <213> Homo sapiens

<400> 7
 Pro Tyr Phe Ile Thr Leu Gly Thr Asp Leu Ala Gln Gln Gln Gly Gly
 1 5 10 15
 Gly Asn Gly Gln Gln Gln Ala Met Ser Phe Ala Ile Leu Arg Ile
 20 25 30
 Ile Arg Leu Val Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser
 35 40 45
 Lys Gly Leu Gln Ile Leu Gly His Thr Leu Arg Ala Ser Met Arg Glu
 50 55 60
 Leu Gly Leu Leu Ile Phe Phe Leu Phe Ile Gly Val Ile Leu Phe Ser
 65 70 75 80
 Ser Ala Val Tyr Phe Ala Glu Ala Asp Glu Pro Thr Thr His Phe Gln
 85 90 95
 Ser Ile Pro Asp Ala Phe Trp Trp Ala Val Val Thr Met Thr Thr Val
 100 105 110
 Gly Tyr Gly Asp Met Lys Pro Ile Thr Val Gly Gly Lys Ile Val Gly
 115 120 125
 Ser Leu Cys Ala Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro
 130 135 140
 Val Ile Val Ser Asn Phe Asn Tyr Phe Tyr His Arg Glu Thr Glu Asn
 145 150 155 160
 Glu

<210> 8
 <211> 157
 <212> PRT
 <213> Homo sapiens

<400> 8
 Pro Tyr Phe Ile Thr Leu Gly Thr Glu Leu Ala Glu Arg Gln Gly Asn
 1 5 10 15
 Gly Gln Gln Ala Met Ser Leu Ala Ile Leu Arg Val Ile Arg Leu Val
 20 25 30
 Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly Leu Gln
 35 40 45
 Ile Leu Gly Gln Thr Leu Lys Ala Ser Met Arg Glu Leu Gly Leu Leu
 50 55 60
 Ile Phe Phe Leu Phe Ile Gly Val Ile Leu Phe Ser Ser Ala Val Tyr
 65 70 75 80
 Phe Ala Glu Ala Asp Asp Pro Thr Ser Gly Phe Ser Ser Ile Pro Asp
 85 90 95
 Ala Phe Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly Asp
 100 105 110
 Met His Pro Val Thr Ile Gly Gly Lys Ile Val Gly Ser Leu Cys Ala
 115 120 125
 Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro Val Ile Val Ser

130		135		140
Asn Phe Asn Tyr Phe Tyr	His Arg Glu Thr	Glu Gly Glu		
145	150	155		

<210> 9
 <211> 164
 <212> PRT
 <213> Homo sapiens

<400> 9
 Pro Tyr Phe Ile Thr Leu Gly Thr Glu Leu Ala Glu Gln Gln Pro Gly
 1 5 10 15
 Gly Gly Gly Gly Gly Gln Asn Gly Gln Gln Ala Met Ser Leu Ala Ile
 20 25 30
 Leu Arg Val Ile Arg Leu Val Arg Val Phe Arg Ile Phe Lys Leu Ser
 35 40 45
 Arg His Ser Lys Gly Leu Gln Ile Leu Gly Lys Thr Leu Gln Ala Ser
 50 55 60
 Met Arg Glu Leu Gly Leu Leu Ile Phe Phe Leu Phe Ile Gly Val Ile
 65 70 75 80
 Leu Phe Ser Ser Ala Val Tyr Phe Ala Glu Ala Asp Asn Gln Gly Thr
 85 90 95
 His Phe Ser Ser Ile Pro Asp Ala Phe Trp Trp Ala Val Val Thr Met
 100 105 110
 Thr Thr Val Gly Tyr Gly Asp Met Arg Pro Ile Thr Val Gly Gly Lys
 115 120 125
 Ile Val Gly Ser Leu Cys Ala Ile Ala Gly Val Leu Thr Ile Ala Leu
 130 135 140
 Pro Val Pro Val Ile Val Ser Asn Phe Asn Tyr Phe Tyr His Arg Glu
 145 150 155 160
 Thr Asp His Glu

<210> 10
 <211> 171
 <212> PRT
 <213> Drosophila melanogaster

<400> 10
 Pro Tyr Phe Ile Thr Leu Ala Thr Val Val Ala Glu Glu Glu Asp Thr
 1 5 10 15
 Leu Asn Leu Pro Lys Ala Pro Val Ser Pro Gln Asp Lys Ser Ser Asn
 20 25 30
 Gln Ala Met Ser Leu Ala Ile Leu Arg Val Ile Arg Leu Val Arg Val
 35 40 45
 Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly Leu Gln Ile Leu
 50 55 60
 Gly Arg Thr Leu Lys Ala Ser Met Arg Glu Leu Gly Leu Leu Ile Phe
 65 70 75 80
 Phe Leu Phe Ile Gly Val Val Leu Phe Ser Ser Ala Val Tyr Phe Ala
 85 90 95
 Glu Ala Gly Ser Glu Asn Ser Phe Phe Lys Ser Ile Pro Asp Ala Phe
 100 105 110

Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly Asp Met Thr
 115 120 125
 Pro Val Gly Val Trp Gly Lys Ile Val Gly Ser Leu Cys Ala Ile Ala
 130 135 140
 Gly Val Leu Thr Ile Ala Leu Pro Val Pro Val Ile Val Ser Asn Phe
 145 150 155 160
 Asn Tyr Phe Tyr His Arg Glu Thr Asp Gln Glu
 165 170

<210> 11
 <211> 163
 <212> PRT
 <213> Rattus norvegicus

<400> 11
 Pro Phe Tyr Leu Glu Val Gly Leu Ser Gly Leu Ser Ser Lys Ala Ala
 1 5 10 15
 Lys Asp Val Leu Gly Phe Leu Arg Val Val Arg Phe Val Arg Ile Leu
 20 25 30
 Arg Ile Phe Lys Leu Thr Arg His Phe Val Gly Leu Arg Val Leu Gly
 35 40 45
 His Thr Leu Arg Ala Ser Thr Asn Glu Phe Leu Leu Leu Ile Ile Phe
 50 55 60
 Leu Ala Leu Gly Val Leu Ile Phe Ala Thr Met Ile Tyr Tyr Ala Glu
 65 70 75 80
 Arg Ile Gly Ala Gln Pro Asn Asp Pro Ser Ala Ser Glu His Thr His
 85 90 95
 Phe Lys Asn Ile Pro Ile Gly Phe Trp Trp Ala Val Val Thr Met Thr
 100 105 110
 Thr Leu Gly Tyr Gly Asp Met Tyr Pro Gln Thr Trp Ser Gly Met Leu
 115 120 125
 Val Gly Ala Leu Cys Ala Leu Ala Gly Val Leu Thr Ile Ala Met Pro
 130 135 140
 Val Pro Val Ile Val Asn Asn Phe Gly Met Tyr Tyr Ser Leu Ala Met
 145 150 155 160
 Ala Lys Gln

<210> 12
 <211> 156
 <212> PRT
 <213> Rattus norvegicus

<400> 12
 Pro Tyr Tyr Val Thr Ile Phe Leu Thr Glu Ser Asn Lys Ser Val Leu
 1 5 10 15
 Gln Phe Gln Asn Val Arg Arg Val Val Gln Ile Phe Arg Ile Met Arg
 20 25 30
 Ile Leu Arg Ile Leu Lys Leu Ala Arg His Ser Thr Gly Leu Gln Ser
 35 40 45
 Leu Gly Phe Thr Leu Arg Arg Ser Tyr Asn Glu Leu Gly Leu Leu Ile
 50 55 60
 Leu Phe Leu Ala Met Gly Ile Met Ile Phe Ser Ser Leu Val Phe Phe

65					70					75					80		
Ala	Glu	Lys	Asp	Glu	Asp	Asp	Thr	Lys	Phe	Lys	Ser	Ile	Pro	Ala	Ser		
				85					90					95			
Phe	Trp	Trp	Ala	Thr	Ile	Thr	Met	Thr	Thr	Val	Gly	Tyr	Gly	Asp	Ile		
			100					105					110				
Tyr	Pro	Lys	Thr	Leu	Leu	Gly	Lys	Ile	Val	Gly	Gly	Leu	Cys	Cys	Ile		
		115					120					125					
Ala	Gly	Val	Leu	Val	Ile	Ala	Leu	Pro	Ile	Pro	Ile	Ile	Val	Asn	Asn		
	130					135					140						
Phe	Ser	Glu	Phe	Tyr	Lys	Glu	Gln	Lys	Arg	Gln	Glu						
145					150					155							

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<210> 13
<211> 149
<212> PRT
<213> Homo sapiens
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